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Reforming Centralized Agricultural Development in Indonesia: A Participatory Food Systems Approach

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Various global development agencies, multinational organizations, transnational corporations, and NGOs continue to express concerns regarding the potential for a global food crisis. This paper aims to identify and analyze the narrative surrounding the global food crisis while proposing a novel participatory food system paradigm that emphasizes the role of civil society in rural Indonesia. This study commences qualitative research via a literature analysis, asserting that activities from governmental and community perspectives possess unique significance. The meanings reflect the social and political construction of the observed object, specifically the paradigm of agricultural development in Indonesia. The author examines diverse dynamic and problematic discourses, gathers secondary data from prior studies, and re-analyzes it through conceptual analysis. The study's results indicate that participatory sustainable agricultural practices may provide a viable approach to addressing the global food crisis. The participatory food system encompasses several critical elements, including a comprehensive assessment of local potential and vulnerabilities, the restoration of natural metabolism via regenerative agriculture, the establishment of an equitable agricultural trade system, political support from both central and local governments, acknowledgment of local food systems at the grassroots level, including those of Indigenous peoples, and multi-stakeholder collaboration (between farmers, policymakers, civil society, academic institution, civic sectors, and Indigenous groups) for the effective implementation of the participatory food system.

Keywords: Participatory food system, sustainable agriculture, global food crisis, local food system, recognition, local livelihood, multi-stakeholder collaboration, food sovereignty.

INTRODUCTION

Food fulfillment in Indonesia shows a big gap between the way the state understands basic needs in various dynamic global-regional-national-local situations, and the perspective of the community as food subjects in fulfilling national food needs. The state has agricultural development packages in terms of meeting the basic needs of the population through various regulations that tend to be centralized. The direction of government policy in food fulfillment efforts emphasizes more institutional aspects or bureaucratization compared to food fulfillment efforts through local food systems. Local food systems place local resources and local knowledge as the basis for community food fulfillment. Communities with various variations of locality in accordance with the

conditions of their respective ecoregions or landscapes and local knowledge have different characteristics in their perspective as food subjects in managing natural resources. These characteristics have implications for sustainable natural resource management practices. Ecoregion conditions also affect people's food consumption patterns, which are influenced by psychological, physiological, cultural and social factors. Both differences in perspective between top-down and bottom-up perspectives certainly have their respective impact on the practice of fulfilling food needs nationally and locally. Moments of food needs fulfillment in Indonesia are also influenced by national and global social and political conditions. Experiences about the encounter of agrarian societies with various dimensions of economic, social and political crisis events that have an impact on food

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fulfilment can be seen from various events. At the time of the 1965 political crisis, food fulfilment took place in parallel with the revolutionary government as it tried to maintain political stability (Mudiyono & Wasino, 2015). When the crisis occurred, the militaristic and centralized approach to Indonesian agriculture was massive and led us to the intensification of agriculture along with the introduction of the green revolution which eliminated much of the biodiversity in the archipelago. The government's main food-related target was to achieve rice self-sufficiency. To this end, the government provided many fertilizer subsidies to farmers and established the Badan Urusan Logistik (BULOG), which serves as a buffer agency for basic needs including rice (Saragih, 2017).

The 1998 economic crisis showed symptoms of changes in the economic structure in big cities, resulting in massive layoffs and making people return to their areas of origin, especially rural areas, which became the economic bumper as well as the livelihood for the lower middle class (Bremen & Wiradi, 2002). During the crisis, the Government of Indonesia signed the IMF Letter of Intent (LoI) which resulted in the termination of subsidies and assistance for farmers, the prohibition of BULOG's monopoly on Nine Basic Foods (Sembako), making BULOG's role also shifted from its role as a basic food buffer agency to now being required to make a profit, and the opening of economic liberalism and free markets in Indonesia (Saragih, 2017; Mariyono, 2014).

In 1999, the government established the Food Security Affairs Agency (BUKP), currently called the National Food Agency (BPN), which is tasked with coordinating and formulating policies in the field of increasing diversification and strengthening food security. Although Indonesia has two institutions focusing on food security, policies related to the national food system are still centralized and do not pay much attention to the conditions of each region's ecoregion. Thus, inequality and food crises still occur in some regions.

The COVID-19 pandemic crisis provides a different picture of food conditions in Indonesia. COVID-19 brought the reality that village resilience plays a major role in maintaining food availability when global economic flows and food distribution supply chains are interrupted due to restrictions on the mobility of agricultural products (Sujito & Ghofur, 2021). In this situation, there are several initiatives carried out to maintain food availability and build community food independence, such as Family Farming and Sustainable Food Yards.

However, this crisis also reveals the limitations of Indonesia's current agricultural development model, which largely depends on external inputs and centralized policies. The reliance on global food supply chains has made local food systems vulnerable to shocks, as seen during the pandemic. While community-driven initiatives like Family Farming and Sustainable Food Yards have proven effective in enhancing food security at the grassroots level, they often receive less

attention in national policy frameworks. This highlights the need to rethink agricultural strategies by incorporating more localized, participatory approaches that empower small-scale farmers and strengthen village-based food systems.

The perspective used by the state to date in agricultural development has been deductive from a global perspective, continuing to national execution, and descending to practice at the local level. Since global fundamentalism through the Millennium Development Goals (MDGs) and Sustainable Development Goals (SDGs), agricultural development in Indonesia has followed the trend of global development down to the local level. Recent national food projects, such as the Food Estate, for example, should also be noted to be a systematic part of a global perspective that often negates local perspectives (Saragih, 2017).

As a center-to-region development package, the Food Estate takes a completely national perspective and 'only' places the local as the space where this national food barn will be built. The risk of failure is also high because it forgets to map local potential, needs, habits and vulnerabilities. This national development package model neglects to strengthen the knowledge-based capacity and habits of local communities and focuses less on the mission of protecting and saving nature.

Developed countries mostly impose their perspectives on developing countries to submit to the global narrative. In this frame, local communities do not have a strong bargaining position to fight back or even just protect the natural environment around them that is the source of their livelihood. The cases of Jokowi's National Strategic Projects (PSN) in Rempang, Kendeng, Wadas, and various other indigenous peoples' territories emphasize the national government's disregard for the rights of these local communities. In fact, if we look further, local communities make a major contribution in maintaining survival and food availability through traditional methods developed based on local knowledge systems and specific ecoregion or landscape conditions (Sujito & Ghofur, 2021).

Learning from the various situations that Indonesia has faced in terms of agricultural development and food fulfillment nationally and from a local perspective, this paper aims to propose an alternative agricultural development that is more participatory. The participatory food proposed in this paper has several main points of thought, among others, being built bottom up in a local perspective, giving recognition to decentralized spatial management, having a paradigm of harmony with nature, and adjusting to the potential of ecoregions and local knowledge as well as heeding natural metabolism including possible vulnerabilities in the form of shocks, trends, and seasonality.

MATERIALS AND METHODS



This paper applies a qualitative research method, namely a literature study related to the food system that has been used in Indonesia centrally and each era has a specific meaning. Each of these meanings indicates the social and political construction of the observed object, namely the paradigm of agricultural development in Indonesia over time. The researcher presents various dynamic and problematic discourses, collects secondary data from previous studies, and re-extracts them in the form of conceptual analysis. In recent decades, each era of government in Indonesia represents a food model that almost entirely emphasizes a centralized food system. This is summarized in the phase of food system dominance in line with rural development in Indonesia such as the green revolution in the 1970s, decentralization and reform in the 1990s, MP3EI in the 2010s, and PSN food estate in the 2020s (Hudayana & Ghofur, 2021; Sujito & Ghofur, 2022). Even local food systems in the world have been promoted by local and national governments at a centralized, even supra-national level (Enthoven & Broeck, 2021; Affre et al., 2024), and occasionally military repression (Napitupulu et al., 2022).

This study employs a critical discourse analysis approach to examine how different food system paradigms have been constructed, contested, and institutionalized across various government eras in Indonesia. The research relies on secondary data sources, including policy documents, academic journals, government reports, and historical records related to Indonesia's agricultural and food policies. By analysing these texts, the study identifies recurring patterns, ideological shifts, and power dynamics that have shaped the country's food system over time. The use of discourse analysis allows for a deeper understanding of the socio-political narratives that justify and sustain centralized food policies while marginalizing alternative local food systems. To complement this textual analysis, the research also incorporates historical institutionalism as an analytical framework to trace the continuity and change in Indonesia's food system policies. This framework helps to contextualize the evolution of food governance, from the Green Revolution to contemporary food estate projects, by examining institutional legacies, policy path dependencies, and moments of policy transformation. The study also cross-references findings with international case studies on food governance to highlight global influences on Indonesia's agricultural trajectory. Through this methodological combination, the research aims to provide a comprehensive understanding of how centralized food systems persist despite increasing global advocacy for localized, community-driven food sovereignty.

RESULTS AND DISCUSSION

Various failures that have occurred in the centralized food system are due to a lack of attention to ecoregion conditions and do not consider the livelihood patterns and vulnerabilities

that exist in each region. This context becomes an important foundation in the development of a sustainable food system. Indonesia has diverse regional typologies, community and human resource characteristics, ecoregion and natural resource potentials and local food characteristics. Therefore, a centralized food system is not a solution for Indonesia's diverse regional characteristics. The development of participatory food system becomes an alternative when the centralized food system cannot guarantee the fulfillment of food needs in a sustainable manner. Participatory food system provides an opportunity for the development of local potential in accordance with the characteristics of the region as well as unique ecoregions and natural agroecosystem resources.

Indonesia's food crisis and lessons learned: Indonesia has experienced several food crises that provided valuable lessons on food security and sovereignty. One striking example is the food crisis in the 1960s, where food supply shortages were caused by a lack of agricultural infrastructure and poor distribution management (Aditya & Hadi, 2020). The government at the time relied too much on rice imports to fulfill domestic needs, which ultimately weakened domestic food production capacity. This crisis has taught the importance of building an independent national production capacity, so that the country does not rely too much on imports that are vulnerable to global market fluctuations. Another food crisis occurred in 1997-1998 during the Asian economic crisis. Food prices soared dramatically due to high inflation and a weakening rupiah exchange rate, resulting in a drastic decline in purchasing power (Suryahadi et al., 2019). This condition was exacerbated by the long drought caused by El Nino, which led to a decline in food production. When the crisis escalated into an economic, social and political crisis in 1998, food insecurity spread to other provinces, especially to urban areas in Java (Soekiman et al., 2001). This situation shows that an economic crisis can quickly develop into a food crisis if national food security is not strong. The lessons learned from this crisis are the importance of economic stability as a fundamental component of food security, as well as the need for policies that protect access to food for vulnerable groups in crisis situations. In the last decade, Indonesia has again faced food challenges amid the threat of climate change. Prolonged drought and extreme weather patterns have disrupted agricultural production in various regions, as was the case in the 2015-2016 dry season (Yanuarti and Nurhasanah, 2017). This shows that food security also depends on adaptability to climate change and drives the urgency in implementing environmentally friendly technologies and sustainable farming methods. This lesson highlights the importance of innovation in agricultural practices, including the development of crop varieties that are resistant to extreme weather.

Finally, the COVID-19 pandemic that hit the world in 2020 also tested national food systems. The pandemic disrupted



global supply chains, resulting in soaring food prices and reduced access to essential foods (Permana, 2021). The experience of the pandemic underscores the need to diversify local food sources to reduce reliance on supply chains that are vulnerable to disruption. It is also a reminder that food security strategies should include emergency preparedness and support the strengthening of local food systems as a resilient foundation in the face of various crises.

In the context of strategies to overcome the shock of the global and national food crisis, Subejo (2022) emphasized that apart from macro policies at the national and regional levels, community-based programs and activities related to community and family food security must be intensively implemented so that they become a solution to overcome problems of stability and access to food and at the same time as an effort to empower communities in rural and urban areas who are experiencing socio-economic pressure during times of crisis.

The failure of Indonesia's centralized agricultural development model: The journey of the Green Revolution in Indonesia, while providing some benefits such as a partial increase in rice production and acceleration in the adaptation of modern agricultural technology, this centralized agricultural policy left various problems that remain to this day in Indonesia. One of the legacies of the green revolution that resulted in massive environmental damage was the excessive use of chemical fertilizers and pesticides that led to environmental degradation (Prihandiani et al., 2021; Widiarta, 2009). This has even led to the dependence of agricultural culture in Indonesia until today. This leaves changes in soil properties, especially in Java, because it was implemented massively over a very long period of time, up to decades (Darmawan et al., 2006). The green revolution not only created dependence on the use of chemical fertilizers but also created dependence on the availability of rice as a staple food commodity. Whereas long before Indonesia implemented the green revolution with a centralized food system, its food wealth was very diverse and became a distinctive feature in each region which was very different from one another in ecoregions. Indonesia's centralized food system, although designed to ensure equitable food availability, has shown a number of failures that impact national food security. Research shows that centralized models tend to rely on long distribution chains and are prone to logistical disruptions (Abdullah et al., 2020). Reliance on centralized distribution often leads to supply delays, especially in rural and remote areas. In addition, food prices often experience significant fluctuations due to high distribution costs and multiple middlemen, which negatively affects people's purchasing power (Rahman & Setiawan, 2019). As a result, areas with inadequate infrastructure are more vulnerable to food shortages. From an economic point of view, the centralized food system also hinders the development of local economies, especially in the small

farming sector. The study by Simatupang et al. (2021) highlights that this model reduces opportunities for local farmers to access the market directly, due to the dominance of large suppliers who control the supply chain. This lowers the purchase price of local agricultural products, making smallholders less profitable, and in turn reducing their appetite for production. In addition, reliance on large suppliers who often come from other regions reduces support for the rural economy, widening the economic gap between the center and the regions.

The sustainability aspect is also a major weak point in the centralized food system. A study by Suharno (2022) shows that this system tends to support intensive agricultural practices that ignore sustainability principles. The use of chemicals in large-scale agriculture, such as pesticides and artificial fertilizers, adversely affects soil quality and the health of local ecosystems. At the same time, large-scale production often results in environmental damage, such as deforestation and water pollution, which in the long run reduces the ability of the food sector to continue to grow.

Policies and focus on increasing national food production that only prioritize on expanding agricultural land or agricultural extensification in Indonesia will not be adequate. Subejo (2025) strongly advocates a multi-approach agricultural development policy and program implemented simultaneously covering intensification, extensification, and diversification for improving agricultural and food production capacity and farmer income.

This study indicates that the centralized approach is unable to address the challenges of diverse food needs in each region. This model tends to ignore the varied local food potential in each region in Indonesia. According to Martono (2023), centralized policies fail to recognize and utilize the rich potential of local foodstuffs, thus hampering food diversification and contributing to food dependence on certain commodities. As a result, centralized food systems are more vulnerable to crises, especially in the midst of economic fluctuations and increasingly evident climate change.

Weakening of the local food system: Indonesia is an archipelago that has a great biodiversity. According to a report by GRID-Geneva International Environment House (2025), Indonesia is the second most biologically diverse country in the world. Indonesia has a large diversity of ecosystems, which includes tropical forests, coral reefs and mangrove ecosystems. The country is also home to the largest tropical peatland in the world with approximately 15 million hectares of peatland (both forested and non-forested) spread across Sumatra, Kalimantan, Sulawesi, and Papua. The diverse ecoregion conditions among the islands in Indonesia make people have different patterns in managing existing natural resources, including the way they develop local food systems. Most communities will develop staple foods according to the availability of foodstuffs in the natural environment around them. The high dependence of



the community on natural resources to meet food needs makes the community very concerned about the sustainability of food sources in nature.

In some parts of Indonesia, we know a variety of natural farming systems, utilizing local resources. Such as upland rice farming, which only conducts the farming process once a year. This allows for regeneration of soil conditions after harvesting. In West Kalimantan, the Undau Mau people apply the shifting cultivation system to maintain the availability of resources and natural sustainability. An agricultural system that is also very concerned about the sustainability of nature is the crop rotation system. Some of these patterns illustrate that the community utilizes existing natural resources only to meet their needs. A study on traditional farming practices in Arfak Mountainous area of West Papua Province by [Krisnawati and Subejo \(2025\)](#) reported that Arfak farmers are still applying indigenous knowledge to this day. Modernization can affect the existence and can also be a threat to the indigenous knowledge of Arfak farmers. The low level of education of farmers, the oral transfer of Indigenous knowledge and the absence of written documentation of indigenous knowledge are the causes of indigenous knowledge being swept away in the flow of modernization. Apart from that, the existence of indigenous knowledge is increasingly threatened by the development of plantations and urban areas. Especially the increasing demand for land for plantations, infrastructure, settlements and mining. Since Indonesia implemented the green revolution with intensive farming systems, natural and traditional farming patterns are increasingly rare. In fact, in some areas, shifting cultivation has been banned, as it is considered to have an impact on the destruction of nature. Examining further, the impacts caused by intensive farming systems are not only damaging soil conditions and eliminating biodiversity. Moreover, the green revolution has changed the food culture and agricultural system of the community. People now tend to carry out an exploitative agricultural system with the use of chemical fertilizers. Changes in the agricultural system that occurred after the Green Revolution have changed the pattern of fulfilling people's basic needs. Currently, people have a high dependence on the availability of rice and no longer utilize local resources such as sago and corn as staple foods. The high dependence on rice has led to the abandonment of natural farming systems and the increasing dependence on the use of chemical fertilizers to increase production yields. On the other hand, the condition of land and other biological resources is increasingly critical as a result of the intensification of agriculture. The relationship between humans and nature in maintaining the sustainability of natural resources is broken.

The breakdown of indigenous/traditional peoples' natural agricultural cycles in Indonesia: Local food systems that exist in Indonesia have been passed down from generation to generation in various indigenous communities. However,

central government policies often ignore and occasionally hamper local food practices and have a direct impact on the socio-economic and cultural welfare of indigenous peoples. Two prominent cases in the above context are the phenomenon of Gastrocolonialism in Papua, and the prohibition of shifting cultivation practices in some areas of Kalimantan Island. The term "gastrocolonialism" refers to the domination of local food systems by external forces, often accompanied by cultural and economic marginalization of Indigenous peoples, especially in Indigenous territories in Indonesia. [Chao \(2021\)](#) in her article "Gastrocolonialism: The Intersections of Race, Food, and Development in West Papua" outlines how development policies and national strategic projects in Papua have disrupted the traditional food system of the Marind people. Governments and corporations often regard local food practices as "outdated" and "inefficient," encouraging the introduction of monoculture crops such as oil palm. As a result, Marind communities' access to their traditional food sources has drastically decreased, threatening not only their food security but also their cultural identity. At the same time, this process of Gastrocolonialism also diminishes generations' understanding of the natural wealth of the environment and its quality, which continues to decline in line with the deforestation process. Another case related to the marginalization of local food also occurred in Central Kalimantan in the case of the prohibition of shifting cultivation practices. The Dayak community has made this slash-and-burn practice an integral part of sustainable natural resource management. However, on the grounds of preventing forest and land fires, the Indonesian central government then issued a policy banning the practice. According to [FIAN Indonesia and The Borneo Institute \(2022\)](#), this ban is a marginalization of local wisdom and directly affects the food sovereignty of the adar community. Traditional shifting cultivation practices have effective fire control mechanisms and contribute to biodiversity conservation. This ban without alternative recognition has caused a decrease in the quantity of local food production and can threaten the sustainability of the customary culture of the Dayak community's local food system.

Local food system inspiration and initiatives in Indonesia:

Participatory food systems are not only about the ability of people to fulfil their food needs independently. More than that, the participatory food system includes a unified system in resource management, including institutional aspects, values and rules, as well as qualified human resources to sustain the fulfilment of food needs in a sustainable manner. Kasepuhan Ciptagelar or currently named Kasepuhan Gelar Alam is a group of indigenous people who are unique in the way they fulfill their food needs and maintain food availability. The Kasepuhan community is located in Sirnaresmi Village, Cisolok District, Sukabumi Regency. Kasepuhan has the meaning of the root word sepuh, which



means 'Old', the word Kasepuhan implies a place where the 'elders' live (Prabowo & Sudrajat, 2021). The main characteristic of the Kasepuhan Gelar Alam community is the communal nature that is still maintained today. This communal nature can be seen from the landownership there, owned by custom or no private landownership. The Kasepuhan Gelar Alam community makes agriculture the main sector of the community's livelihood. But uniquely, the local community never sells their rice harvest. Instead, they keep it in the barn, which the local people call 'leuit'. This wisdom is based on the local belief of 'mupusti pare, lain migusti', which means honouring rice but not deifying it (Prabowo & Sudrajat, 2021). The size of the leuit varies, with the average leuit measuring approximately 300 x 220 x 370 cm. The roof of the leuit uses thatch or palm fibre grass, the walls are made of woven bamboo called bilik, while the floor of the leuit uses planks, and the roof and building frames are made of wood (Aulia & Adhitama, 2021; Aulia & Adhitama, 2021). With such materials, it is possible to store rice for a long time in the leuit. Moreover, the paddy before being put into the leuit first goes through a drying process by drying in the sun until it is completely dry. Each family head in Kasepuhan Gelar Alam has one to three leuit. This indicates that each family head has the responsibility to ensure the availability of food to meet the needs of all family members. Rice planting in Kasepuhan Ciptagelar (Kasepuhan Gelar Alam) is done once a year and naturally, by not using pesticides, and not using modern agricultural equipment, such as tractors (Ikmaludin et al., 2018; Ikmaludin et al., 2018). These efforts are made by the local community to maintain the natural condition of the soil and maintain biodiversity on the agricultural land they manage. With various efforts made, the Kasepuhan Gelar Alam community is able to fulfil their basic food needs independently and even has food reserves for the next 10 years. The success of the community in Kasepuhan Gelar Alam in maintaining food availability in the long term is also influenced by the existence of adequate land-carrying capacity. Land carrying capacity is a condition of land availability both in quality and quantity. The availability of agricultural land carrying capacity is influenced by several factors, such as the socio-cultural system of the community, which includes the land division system, social institutions and local wisdom values (Sudrajat et al., 2020). Good practices related to local food in Indonesia can also be found in several regions of Indonesia. The people of Sumba, who rely on rain-fed land that only goes through an intensive planting period once, really conserve their harvested cereals for consumption for a whole year. In Papua, although gastrocolonialism has invaded the food culture with instant foods such as instant noodles and wheat flour, some residents still protect their forests as a source of staple food, in this case, sago. In Negeri Rutong Ambon, people still maintain sago as a source of staple food. Good initiatives related to local wisdom practices related to local food in

Indonesia can still be found in several places. On Sumba Island, where communities still rely on dryland or rainfed farming systems, with an intensive planting period that is only once a year during the rainy season. Indigenous people in Sumba traditionally practice efficient post-harvest management for cereal foods such as maize and sorghum, in order to meet food needs for the whole year ahead. Research conducted by Setiawan et al. (2020) shows that this traditional approach helps maintain household food sovereignty as well as preserve local biodiversity. This kind of approach is proof that the wisdom of local food systems can be one of the solutions to various kinds of food challenges in the future.

In Papua, although local food culture is constantly being eroded by Gastrocolonialism through various entry points, such as dependence on instant food made from wheat, there are still indigenous communities that preserve their traditional food sources. Sago, as a staple food, is still maintained by some indigenous communities who manage forests and natural resources in Papua sustainably. Various efforts are made by indigenous peoples to preserve forests as a source of food and sago, which has an important role in protecting local ecosystems from being damaged by expansive industries (Chao, 2021).

A similar story of a community's efforts to maintain its local food system also happened in Rutong, Ambon, Indonesia. The community consistently uses sago as the main food ingredient in their daily lives, despite the huge challenge from modern consumption that provides wheat as a more readily available ingredient. The study by Rianse and Usman (2019) reveals how sago-based food is not only maintained for its cultural value but also to support the sustainability of the local food system in the region. These three cases clearly show that while national policies are often not in line with the sustainability of local food systems, local communities, indigenous peoples and local citizens, remain at the forefront of the sustainability of local food systems in Indonesia.

The success of the initiative to develop a participatory food system model in Indonesia is to some extent determined by resource management, institutional models, values and rules as well as human resource capacity. Briefly, the initiative for developing the perspective of the participatory food system model is presented in the following matrix.

Indonesia's participatory food system model: Local community participatory food systems are becoming an increasingly discussed alternative as a solution to food security problems in various regions, especially in developing countries such as Indonesia. Local food systems are based on the principles of sustainability and self-reliance, where local communities can produce, manage and consume food produced in their own region (Altieri, 2018). This reduces dependence on imports or large-scale distribution that is vulnerable to external disruptions. According to a study by Rosset et al. (2017), local food systems can shorten supply chains and maintain food quality, as food is produced and



Table 1. The initiative for developing a participatory food system model in Indonesia.

Key Elements	Fundamental aspects	Prospective Improvement Strategies
Resource management	Managing land, water, forest, seed, etc.	Utilize local resources that have been proven to be adaptive optimally and adopt broad-based innovations that are adaptive and do not damage local resources
Institutional models	Mechanism local resources usage and arrangements	Optimizing local leadership and institutions that have been continuously internalized in community livelihoods
Values and rules	Principles and custom in the community on local resources management	Principles of resource management that provide benefits to individuals and communities bound in a system of social validation and social sanctions
Human resource capacity	Community ability and capacity to utilize local resources	Strengthening and inheriting social capital through knowledge, experience and collective actions of the community in sustainable management of local resources

consumed over a shorter period, making it fresher and more nutritious.

Participatory food involves communities in every stage of the food supply chain, from planning to distribution. This approach emphasizes the importance of community involvement in determining the types of commodities to be grown according to local needs and climatic conditions. A study by [Patel \(2012\)](#) shows that participatory food has benefits in improving the welfare of smallholder farmers and promoting food diversification, which is important to reduce dependence on one particular commodity. With community involvement in planning and implementation, participatory food increases local ownership and responsibility for food security. In addition, local and participatory food systems have a positive impact on reducing carbon footprints. Locally produced and distributed food reduces the need for long-distance transportation, which contributes to global carbon emissions ([Clapp & Fuchs, 2009](#)). By developing sustainable agricultural practices and using traditional methods adapted to local ecosystems, communities can produce food that is more environmentally friendly. Research also shows that local food systems can improve food security amidst the threat of climate change, as local communities are more flexible in adapting their agricultural practices according to changing climatic conditions and available resources ([FAO, 2020](#)).

Local and participatory food systems also play an important role in supporting the rural economy. With this approach, people in rural areas can obtain more equitable economic opportunities, where they benefit directly from the harvest without having to go through intermediaries. A study by [De Schutter \(2014\)](#) revealed that participatory food not only adds to economic welfare but also revives local food-related cultures. Thus, strengthening local and participatory food systems in Indonesia can be a relevant step towards achieving inclusive, equitable and sustainable food security. Participatory Food Systems in Indonesia will play a central role in maintaining food sovereignty, environmental sustainability, and the socio-cultural identity of local communities. However, various challenges such as changing consumption patterns and vulnerabilities such as climate crisis, come along with centralized food policies that threaten

the sustainability of local food systems in Indonesia. This participatory approach can be one of the comprehensive alternatives that will consist of 6 key points, each of which will be explained in the next section.

First, the initial step in building a local food system model is to diagnose potential and threats at the local level. Understanding the characteristics of ecoregions and landscapes is an important basis for designing food systems that are appropriate to local conditions. Identification of local resource potentials, such as the presence of endemic food crops, can be key in supporting local wisdom-based food security. In addition, threats such as climate crisis, environmental degradation and changes in livelihood patterns due to modernization must be anticipated through in-depth analysis. With thorough mapping, a local food system model can be designed to capitalize on potential while mitigating risks.

Second, the restoration of natural metabolism is at the core of regenerative planning. This involves rehabilitating ecosystems damaged by overexploitation and using environmentally friendly technological innovations to support sustainable food production. Community-based participatory action research (CBPAR) is a relevant approach to involve communities in every stage of planning and implementation. With this approach, local communities are not only beneficiaries but also active actors in the process of regenerating their environment and improving their food capacity.

Third, an equitable agricultural trading system must be built with a re-technocracy approach that involves strengthening local food institutions. Food committees that operate in a bottom-up manner can be a platform to advocate for local needs. Local food system working groups are also important to coordinate various initiatives and ensure inclusiveness in decision-making. With this approach, local food systems will not only become more efficient but also more equitable for all levels of society.

Fourth, a participatory local food system requires real support from the government, both at the national and regional levels. This includes increasing the voice, access and control of communities over local resources that are the basis of their livelihoods. Protection of local food commodities from global



Table 2. Key points for improving participatory food system model in Indonesia.

Key Elements	Determinant Factors	Prospective Improvement Strategies
Building local food system	Internal factor	Mapping and optimizing local food resources
Restoration of nature ecosystem	Internal factor	Maintaining and improving environmentally friendly innovations
Equitable trading system	Internal factor-External factor	Promoting and strengthening local food system working group
Governmental supports	External factor	Giving appropriate room for voice, access and control of community on local resources; Protecting local interest and resources
Recognition of local livelihoods	Internal factor-external factor	Integrating the needs of indigenous peoples into the national food system
Involvement of multi-stakeholders	External factor	Multi-stakeholders support for improving local relevance involving various governmental agencies, communities and other stakeholders

market pressures, such as excessive exports and imports, should also be a priority. In addition, the reformulation of Indonesia's food policy needs to be designed to provide more space for local food systems based on justice and sustainability.

Fifth, recognition of indigenous peoples' livelihood patterns is an important step in building an inclusive local food system. It is important to provide space for indigenous communities to voice their needs and aspirations, especially in fighting the marginalization that has occurred so far. Gastrocolonialism and other centralized food approaches must be stopped, as they are proven to threaten indigenous peoples' food sovereignty. By integrating the needs of indigenous peoples into the national food system, the government can strengthen cultural diversity as well as local food security.

Sixth, a participatory approach requires the involvement of various stakeholders from different sectors. Top-down support is needed in terms of policy and funding, while implementation should center on a bottom-up approach to ensure local relevance. Joint evaluations involving government, communities and other stakeholders should be part of the program cycle. In addition, local initiatives that have been proven effective can be replicated and strengthened to achieve greater scale.

In summary, key issues that are prospectively to be designed and implemented in building a participatory food system model in Indonesia are presented in the following matrix.

Conclusion: Learning from the history of how Indonesia has overcome the difficulties of food fulfillment in several crisis situations, the importance of a more participatory local food system is inevitable. This participatory local food will be more resilient, sustainable and inclusive. In the implementation process, this participatory food model must be able to capture the opportunities of democracy and regional autonomy. The challenge is that both central and local governments must have confidence in local potential in managing this participatory food. It takes national commitment, and it takes radical policies to at least manage agricultural trade systems in favor of local farmers and smallholders, as well as a reduction in the conversion of productive agricultural land for reasons of national strategic projects. Local agricultural commodity project policies are

needed from upstream to downstream, from the supply of seeds - agricultural inputs to ways to protect the trading system of the harvest from below. This process can be done without the state, but it takes a long time. The presence of participatory food model supported by both central and local governments will be in line and one breath with food democratization in Indonesia. The success of participatory food system should include three aspects, namely knowledge, attitude and practice. What is important to note in this context is the affordability of community access to resources to develop local food systems. In the implementation process, this participatory food model must be able to capture opportunities for regional autonomy. The challenge is that both central and regional governments must have confidence in local potential in managing this participatory food. It takes national commitment, and radical policies are needed to at least manage agricultural trade systems in favor of local farmers and smallholders, as well as to reduce the conversion of productive agricultural land for reasons of national strategic projects. Policies to protect local agricultural commodities are needed from upstream to downstream, from the supply of seeds - agricultural inputs to ways to protect the trading system of the harvest from below. This process can be done without the state, but it takes a long time. The presence of participatory food model supported by both central and local governments will be in line and one breath with food democratization in Indonesia. An important proponent of food self-sufficiency in Indonesia is village engagement and food revival from the periphery. Bottom-up agricultural and rural development can support people to be sovereign in fulfilling their primary needs and quality of livelihood, while reducing the technical damage caused by centralized policies. The government also needs to give full support to local food for better quality. It is necessary to increase and strengthen local capacity, by starting to create local food centers, local food barns that are built in a participatory manner. The state should no longer *underestimate locals*. Furthermore, the participation of academics and researchers is needed to come up with alternatives to sustainable nature management in accordance with ecoregions. Supported by the campus, both lecturers in universities and researchers in various research



centers, as well as other middle classes such as NGO activists and activists provide support for participatory food models.

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Policy referred. Centralized Agricultural Development Policy; Decentralization and Participatory Governance Policy; Food Sovereignty Policy Framework.

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REFERENCES

- Abdullah, A. (2020). Centralized food distribution and its vulnerabilities in Indonesia's food security framework. *Journal of Agricultural Policy Research*, 13, 45-63.
- Aditya, R., & Hadi, S. (2020). The impact of food crisis on national food security in Indonesia during the 1960s. *Journal of Agricultural Development Studies*, 8, 101-115.
- Affre, L., Guillaumie, L., Dupéré, S., Mercille, G., & Fortin-Guay, M. (2024). Citizen participation practices in the governance of local food systems: A literature review. *Sustainability*, 16, 5990.
- Altieri, M. A. (2018). *Agroecology: The science of sustainable agriculture*. CRC Press.
- Anderson, K., & Nelgen, S. (2013). Food price spikes and price insulation by emerging East Asian countries. *Food Policy*, 40, 39-52.
- Aulia, A. N., & Adhitama, G. P. (2021). The meaning of the existence of leuit, saung lisung, and goah in Sunda Kasepuhan Ciptagelar in maintaining food security. *Narada: Journal of Design and Art*, 8, 71.
- Breman, J., & Wiradi, G. (2002). The impact of krismon. In *Good Times and Bad Times in Rural Java* (pp. 227-291). Brill.
- Clapp, J., & Fuchs, D. (2009). *Corporate power in global agrifood governance*.
- Chao, S. (2021). Gastrocolonialism: The intersections of race, food, and development in West Papua. *The International Journal of Human Rights*, 25, 811-832.
- Darmawan, K., Kyuma, A., Saleh, H., Subagjo, H., Masunaga, T., & Wakatsuki, T. (2006). Effect of green revolution technology from 1970 to 2003 on rice field soil properties in Java, Indonesia: I. Carbon and nitrogen distribution under different land management and soil types. *Soil Science and Plant Nutrition*, 52, 634-644.
- De Schutter, O. (2014). The transformative potential of the right to food. In Enthoven, L., & Van den Broeck, G. (2021). *Local food systems: Reviewing two decades of research*. Agricultural Systems.
- FIAN Indonesia & The Borneo Institute. (2022). *Manyeha tana, a local and/or customary farming system that has not been recognized and protected by the state*.
- Food and Agriculture Organization (FAO). (2019). *The state of food security and nutrition in the world: Safeguarding against economic slowdowns and downturns*. FAO Report.
- Food and Agriculture Organization (FAO). (2020). *The state of food security and nutrition in the world*.
- GRID-Geneva International Environment House. (2025). *Biodiversity in Indonesia*. <https://dicf.unepgrid.ch/indonesia/biodiversity>
- Hudayana, B., & Ghofur, M. (2021). *Cassava for Indonesian food sovereignty*. Center for Rural and Regional Studies, UGM.
- Ikmaludin, I., Kusmana, C., & Amirudin, S. (2018). Typology of agricultural cultivation system and sustainability of food availability in Kasepuhan Ciptagelar indigenous community in Sukabumi. *Risalah Kebijakan Pertanian dan Lingkungan: Strategic Studies in Agriculture and Environment*, 5, 14-26.



- Krisnawati, A. B. R., & Subejo. (2025). Indigenous knowledge on shifting cultivation and sustainable agriculture. *Journal of Global Innovations in Agricultural Sciences*, 13, 169-179.
- Martono, S. (2023). Diversification challenges within centralized food systems: The case of Indonesia. *Journal of Food Systems and Sustainability*, 21, 87-103.
- Mariyono, J. (2014). Rice production in Indonesia: Policy and performance. *Asia Pacific Journal of Public Administration*, 36, 123-134.
- Mudiyono, M., & Wasino, W. (2015). The development of food crops in Indonesia in 1945-1965. *Journal of Indonesian History*, 4.
- Napitupulu, H., Hidayat, T., Bainus, A., & Dermawan, W. (2022). Food securitization in Indonesia: The involvement of Indonesian military in food security program. *Specialusis Ugdyas*, 1, 3338-3352.
- Patel, R. (2012). Food sovereignty: Power, gender, and the right to food. *PLoS Medicine*, 9, e1001223.
- Patel, R. (2012). Food sovereignty and the centralization of food systems: Lessons from the global south. *Journal of Agrarian Change*, 12, 231-249.
- Permana, A. (2021). The COVID-19 pandemic and food supply chain disruptions in Indonesia. *Journal of Global Food Security*, 12, 56-63.
- Prabowo, Y. B., & Sudrajat, S. (2021). Local wisdom of Kasepuhan Ciptagelar: Agriculture as a symbol of culture and natural harmony. *Journal of Indonesian Customs and Culture*, 3, 6-16.
- Prihandiani, A., Bella, D., Chairani, N., Winarto, Y., & Fo, J. (2021). The tsunami of pesticide use for rice production on Java and its consequences. *The Asia Pacific Journal of Anthropology*, 22, 276-297.
- Rahman, M., & Setiawan, D. (2019). Price volatility in the centralized food supply chain: The case of rice in Indonesia. *Economic Journal of Food Policy*, 27, 114-130.
- Rianse, U., & Usman, H. (2019). Sago as local food resilience in Maluku: Challenges and opportunities. *Indonesian Agricultural Journal*.
- Rosset, P., & Altieri, M. A. (2017). *Agroecology: Science and politics* (p. 160).
- Saragih, J. P. (2017). National agency for food affair of distinguished governments and food supply policy. *Pangan*, 26, 70-71.
- Setiawan, E. (2020). Traditional farming practices and food security in Sumba: Preserving local wisdom for sustainable agriculture. *Journal of Local Food Systems Research*.
- Simatupang, R. (2021). The impact of centralized food policies on small farmers in Indonesia. *Journal of Rural Development and Agrarian Studies*, 19, 203-220.
- Soekirman. (2001). Food and nutrition security and the economic crisis in Indonesia. *Asia Pacific Journal of Clinical Nutrition*, 10, S57-S61.
- Subejo. (2022). Issues, trends, problems and strategies for ensuring food security: Lessons from Indonesia. In Winanti, P. S., & Mas'udi, W. (Eds.), *G20 in the middle of big change: Momentum for Indonesia's global leadership?* UGM Press.
- Subejo. (2025). Indonesian food and agriculture: Quo vadis. *Independent Observer*, January 24-30, 2025. <https://observerid.com/indonesian-food-and-agriculture-quo-vadis/>
- Sudrajat, S., Suhendra, S., & Mawardani, A. (2020). Assessment of land support and agricultural sustainability in Duren Village, Bandung Subdistrict, Semarang Regency. *Majalah Geografi Indonesia*, 33. <https://doi.org/10.22146/mgi.51228>
- Sujito, A., & Ghofur, M. (2021). Reorienting Indonesia's agricultural development after the COVID-19 crisis. IRE Yogyakarta.
- Sujito, A., & Ghofur, M. (2022). Nurturing food sovereignty from the peripheral side: The village law and the soul of agriculture in rural development in Indonesia. *Sodality: Journal of Rural Sociology*, 10, 305-316.
- Suharno, J. (2022). Environmental and sustainability challenges of centralized food systems. *Journal of Environmental Sustainability*, 15, 156-172.
- Suryahadi, A. (2019). The Asian financial crisis and its impact on food security in Indonesia. *Indonesian Economic Studies*, 55, 132-150.
- Widiarta, A., Rosyida, I., Gandi, R., & Muswar, H. (2009). Peasant empowerment through social capital reinforcement: A road to sustainable organic agriculture development (Case study: Indonesian Peasant Union, Cibereum Situleutik Village, Dramaga Bogor, West Java, Indonesia). *Asian Journal of Food and Agro-Industry*, 2.
- Yanuarti, S., & Nurhasanah, I. (2017). Climate change and its impact on agriculture in Indonesia: A case study during the El Niño season. *Journal of Environmental Management*, 45, 234-246.

